MIM -TDR Antimalaria Drug Resistance Network:
Workshop on *in vitro* Susceptibility Testing of Antimalarial Drugs

A workshop was held in Cotonou, The Republic of Benin from August 19th – 29th as one of a series of activities to train network investigators on the protocols and SOPs for *in vitro* Drug SusceptibilityTesting of Antimalarial Drugs to *Plasmodium falciparum*, as one of the four parameters for drug resistance, identified and investigated by the MIM -TDR Anti-malaria Drug Resistance Network. The other three being, the clinical evaluation of drug efficacy; the determinations of blood drug levels of antimalarial at the time of therapeutic failure and the association of mutations on genes involved with drug metabolism, as markers of resistance. Details and activities of the MIM -TDR, ADRN can be obtained from its website: (http://www.nih.gov/nlm/malaria/ADRN).

The objectives of the workshop were to: 1) To provide hands on training of designated network investigators from Ghana, Nigeria, Mali, Tanzania and Uganda on short term *in vitro* culture of malaria parasites and related techniques for evaluating susceptibility of *Plasmodium falciparum* isolates to antimalarial drugs, (Double ELISA (DELI), Histidine Rich Protein 2 (HRP2) and Schizont Inhibition Assays). 2) To initiate standardization of protocols for use by the network sites for *in vitro* susceptibility testing of *Plasmodium falciparum* isolates to antimalarial drugs.

Fifteen participants including investigators from the network sites (10), the host institution *Institut des Sciences Biomedicales Appliqués*, Benin (4) and the Malaria Control Program in Zanzibar were trained on the techniques during the workshop.. The workshop was facilitated by scientists and personnel from the College of Medicine University of Ibadan Nigeria; University of Yaounde Cameroon; Universite D'Abomey-Calavi, Cotonou, Republic of Benin; Walter Reed Army Institute for Research, Washington DC, USA; Army Malaria Institute, Enoggera, Queensland, Australia; Malaria Research and Reference Reagents Resource Center (MR4), Manassas VA, USA and the WHO/TDR, Geneva

Formal lectures on the malaria diagnosis, efficacy tests, *P. falciparum* biology, biochemistry, cultivation , drug susceptibility testing techniques and data management, analysis and interpretation were presented in the first half of the workshop. The lectures were delivered in the morning followed by hands-on practical sessions in the afternoons. Practical sessions were organized to give the participants ample opportunity to perform all the procedures by themselves. The activities included preparation of micro-titer plates for susceptibility tests and ELISA, preparation of parasite cultures and microscopy. Special attention was given to training the participants to read and evaluate thick and thin blood films and to understand the morphology of the malaria parasite at different stages of the development in the red blood cells.

Protocols in efforts to standardize the procedures for use by the network, resulted in a draft SOP that was developed and circulated at the end of the workshop. The contents of the document includes: i) the design and procedure for preparing micro-titre plates for testing *in vitro* susceptibility to the first and second line drugs of the different countries, ii) procedures for using the morphological assessment of schizont maturation for drug susceptibility testing by the network. iii) procedures for preparing plates for the DELI assay. iv) procedures for the HRP2 assay. At the end of the workshop, all sites were provided with standard antimalarial drugs, a Compact Disc containing electronic versions of the lectures and SOP, a videotape of the instructional sessions. HRPII kits provided by MR4 were to distributed to sites registered with MR4.

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